

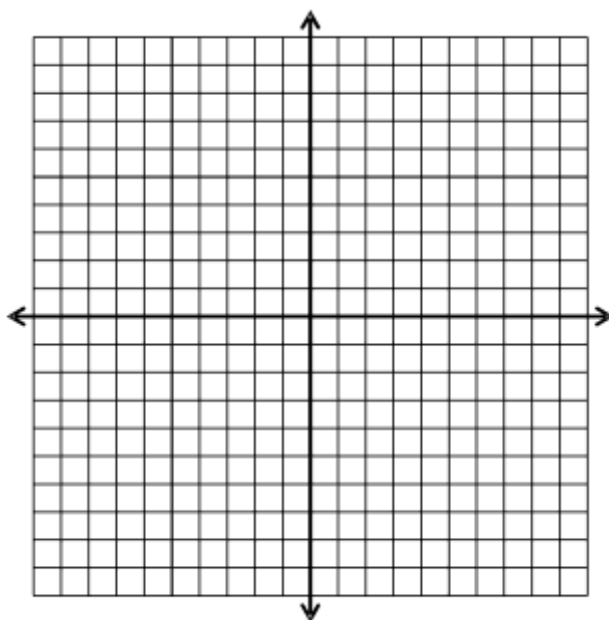
Unit 2 Test - Polynomial and Rational Functions**PRACTICE**

Expectation	Level
C1. identify and describe some key features of polynomial functions, and make connections between the numeric, graphical, and algebraic representations of polynomial functions;	

1) Fill in the following chart

Function	Degree	Positive or Negative Lead Coefficient	End Behaviours	Max number of turning points	Min number of zeros
$f(x) = -x + 5x^2 - 6x^3 + 10$					
$f(x) = (x - 4)^3(x - 1)$					

2) Sketch a **possible (approximate)** graph for each function in question 1.



3) Discuss the number of roots and the number of turning points a function can have.

Expectation	Level
C2. Identify and describe some key features of the graphs of rational functions, and represent rational functions graphically;	

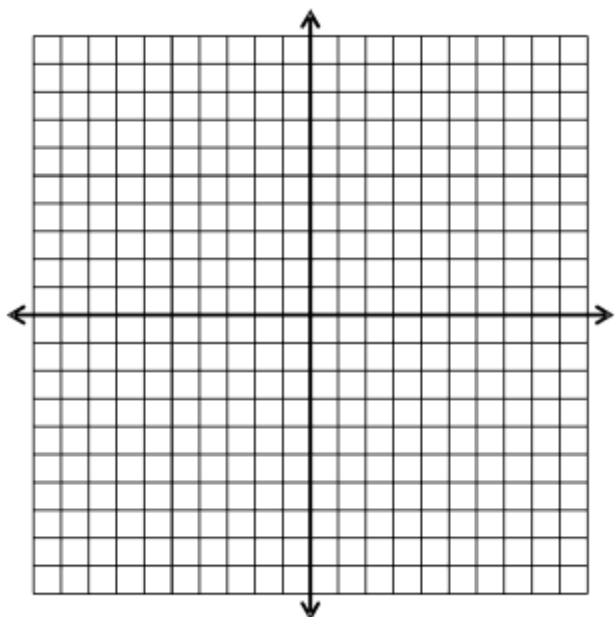
4) **Sketch** a function with the following properties:

A)

- Horizontal asymptote at $y = -4$
- Vertical Asymptote at $x = 3$
- y -intercept at -2

B)

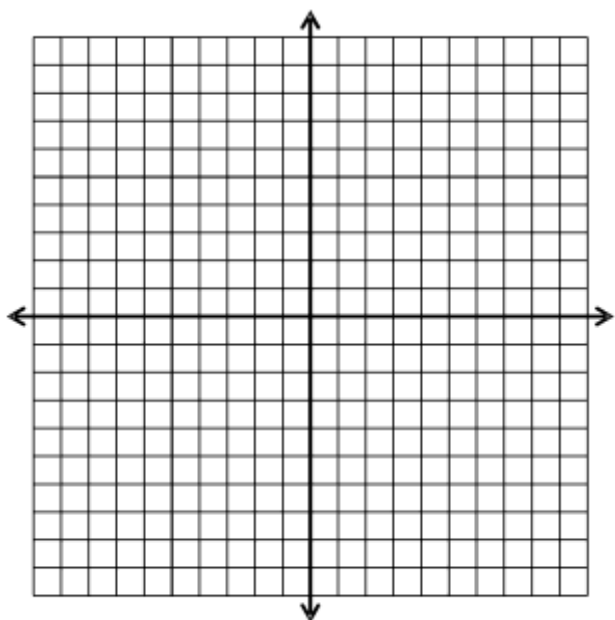
- Roots $3, 8, -1$
- Degree 4
- y -intercept at -5



4b) What is a possible equation for your functions?

5) Graph the following rational equation and indicate the key features below:

$$g(x) = \frac{-2x-9}{x^2-3} - 1$$



Domain:

Range:

Positive Intervals:

Negative Intervals:

Intervals of Increase:

Intervals of Decrease:

Expectation	Level
C3 - solve problems involving polynomial and simple rational equations graphically and algebraically;	

6) Factor the following fully (show work using either synthetic or long division):

a) $4x^4 + 23x^3 - 4x^2 - 113x - 90$

b) $x^3 - 5x^2 + 7x - 3$

7) For what values of k does the function $f(x) = x^3 + 6x^2 + kx - 4$ give the same remainder when divided by $(x-1)$ and $(x+2)$

8) An open box is made from a rectangular piece of cardboard with dimensions 12 cm by 18 cm, by cutting congruent squares from each corner and folding up the sides. Determine all possible dimensions of the squares to be cut to create a volume of 216 cm^3 .

9) A grade 11 class, on a field trip to Montreal, had lunch in a restaurant. The bill came to \$239.25. Four students had birthdays that day, and it was agreed that these four should not have to pay for lunch. The other students had to pay \$1 more than if all the students had paid. How many students had lunch?

Expectation	Level
C4. Demonstrate an understanding of solving polynomial and simple rational inequalities.	

10) Solve the following inequalities:

a) $x^3 - 8x^2 < x - 9$

b) $\frac{x+1}{x-2} > \frac{x-3}{x+3}$

c) $\frac{x^2-4}{x-2} > \frac{3}{x+3}$